Patent
Attorney Docket No. 400846

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

TOYOSHIMA et al.

Application No.:	Unassigned	Art Unit:	Unassigned
Filed:	December 18, 2000	Examiner:	Unassigned
For:	METHOD OF PRODUCING A MULTI-LAYERED WIRING BOARD		

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D. C. 20231

Dear Sir:

Prior to examination, Applicants request that the referenced patent application be amended as shown below.

IN THE SPECIFICATION

Page 1, line 1, delete entirely;

line 11, delete "rapidly";

line 12, delete "the";

line 14, change "electric" to --electrical--;

line 16, change "press" to --pressure--;

line 21, change "by" to --of--;

line 22, change "generally the" to --, generally, a--;

Page 2, line 7, delete ", for example";

line 10, change "photo" to --photolithographic--;

Page 3, line 1, change "holding electric" to --electrical--;

line 13, delete "away an";

line 19, change "structures" to --structure--;

line 23, delete "away";

Page 4, line 1, change "is buried into" to --fills--;

line 3, change "the" to --a--;

line 4, delete "an";

delete "applying";

line 5, delete "to";

line 6, delete "growing";

change "on only" to --only on--;

Page 5, line 2, after "irradiating" insert --with--;

line 6, change "provided to" to --of--;

line 7, after "and" insert --,--;

line 15, delete "the";

change "by" to --of--;

line 17, change "miniaturize" to --miniaturizes--;

line 18, change "lamination" to --laminations--;

line 24, delete "the";

change "by" to --of--;

Page 8, line 18, change "according to the" to --using a--;

line 19, change "photo" to --photolithographic--.

IN THE CLAIMS

1. (Amended) A method of producing a multi-layered wiring board comprising [the steps of]:

forming an insulating layer [made] of a photosensitive resin on a substrate for forming multi-layered wiring, and exposing and developing said insulating layer to form holes having a [predetermined shape] size;

depositing a curable resin onto said insulating layer having [said] the holes [formed therein in such a manner as to bury said] and filling the holes, and heating said curable resin to form a cured thin film of said curable resin on [the surface of] said insulating layer; and

removing said curable resin [in such a manner as to leave], leaving said cured thin film and [to form] via-holes having a [reduced opening] size reduced by said cured thin film from the size of the holes.

2. (Amended) [A] The method of producing a multi-layered wiring board according to claim 1, wherein said photosensitive resin is at least one member selected from the group consisting of an epoxy resin, an epoxy-modified acrylate resin, a cationic polymerization product of an epoxy resin, a

phenol resin, a melamine resin, a carboxy-modified epoxy acrylate, and a cinnamate.

3. (Amended) [A] The method of producing a multi-layered wiring board according to claim 1, wherein said curable resin comprises one of a water-soluble resin [or] and a water-soluble cross-linking agent.

4. (Amended) [A] The method of producing a multi-layered wiring board according to claim 1, wherein said curable resin is at least one member selected from the group consisting of polymethylsiliceous siloxane, a melamine resin, an acrylate resin, and an epoxy resin.

5. (Amended) [A] The method of producing a multi-layered wiring board according to claim 1, wherein said curable resin contains rubber particles consisting of a butadiene-acrylonitrile copolymer, and [said method further comprises the step of] including chemically surface-roughening said cured thin film.

6. (Amended) [A] The method of producing a multi-layered wiring board according to claim 2, wherein said curable resin comprises one of a water-soluble resin [or] and a water-soluble cross-linking agent.

7. (Amended) [A] The method of producing a multi-layered wiring board according to claim 2, wherein said curable resin is at least one member selected from the group consisting of polymethylsiliceous siloxane, a melamine resin, an acrylate resin, and an epoxy resin.

8. (Amended) [A] The method of producing a multi-layered wiring board according to claim 3, wherein said curable resin contains particles of one of calcium carbonate [or] and polybutadiene rubber.

9. (Amended) [A] The method of producing a multi-layered wiring board according to claim 4, wherein said curable resin contains particles of one of calcium carbonate [or] and polybutadiene rubber.

10. (Amended) [A] The method of producing a multi-layered wiring board including a plurality of stages of via-holes formed by repeating [said] the process [steps] of claim 1, wherein [said] the via-holes of upper stages [are so formed as to posses a greater degree of reduction] are more reduced in size than [said] the via-holes of lower stages.

IN THE ABSTRACT

Please replace the existing Abstract of the Disclosure with the appended Abstract of the Disclosure.

REMARKS

The foregoing changes are made to improve the form of the patent application. No new matter has been added and entry is respectfully requested.

In re Appln. of Toyoshima et al.
Application No. Unassigned

A favorable Action on the merits is solicited.

Respectfully submitted,

LEYDIG, VOIT & MAYER

Jeffrey A. Wyand,
Registration No. 29,458

Suite 300
700 Thirteenth Street, N. W.
Washington, D. C. 20005
Telephone: (202) 737-6770
Facsimile: (202) 737-6776
Date: December 18, 2001
JAW:cmcg

ABSTRACT OF THE DISCLOSURE

A method of producing a multi-layered wiring board includes exposing and developing a photosensitive resin to form holes having a size; depositing and forming a curable resin on the insulating layer, filling the holes and heating to form a cured thin film of the curable resin on the insulating layer; and removing the curable resin, leaving the cured thin film and producing via-holes having an opening reduced in size from the size of the holes by the cured thin film.